



OatWell®

Heart healthy oat beta-glucan

Executive summary

Heart health is one of the world's most pressing health concerns. According to the World Health Organization, cardiovascular disease (CVD) is the number one cause of death globally among both men and women.

With conditions such as obesity and diabetes soaring – both of which are linked to an increased risk of CVD – the problem looks set to escalate. Left unchecked, the potential social and economic burden for healthcare systems across the developed world is significant.

The cost to the EU economy, for example, is estimated to be over €196 billion per year according to the European Society for Cardiology (ESC) and European Heart Network (EHN).¹ This figure not only reflects early mortality and care costs, but also absence from work or early retirement.

It is common knowledge that certain dietary habits are protective against CVD, yet more needs to be done to educate medical professionals, governments and consumers on the role that nutritional solutions can play in addressing the risk factors associated with heart health concerns.

This whitepaper examines the heart health benefits of an increasingly popular ingredient, oats. It summarizes the latest research on the proven effect of its active component, oat beta-glucan, on both serum cholesterol and blood glucose reduction as well as providing regulatory guidance. Numerous clinical studies demonstrate that oats and oat beta-glucan can be recommended as part of a healthy diet to reduce the risk of CVD.

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Introduction

Diet is one of the most influential factors determining the overall risk of CVD. High intake of processed foods loaded with undesirable salt, fat and sugar – combined with a sedentary lifestyle – can damage the heart’s arterial and muscular function.

In modern societies, many people struggle to eat nutritionally rich foods due to work, social or family commitments. A balanced diet may demand behavioral change and a dramatic shift in lifestyle for many, but functional foods, beverages and dietary supplements provide a convenient way to achieve proper nutrition.

Many products and ingredients are already well known and accepted by consumers for their benefits to health. Oats are very much in this coveted category. A simple ingredient which is easy

Oat beta-glucan: take heart

Lowers cholesterol

Oat beta-glucan is a soluble form of dietary fiber that produces a cholesterol lowering effect due to its high viscosity. It dissolves inside the digestive tract where it forms a thick gel in the small intestine. This viscous ‘net’ traps cholesterol related particles (bile acids) and prevents them from being absorbed into the blood stream. They are then passed, harmlessly, out of the body. When the liver subsequently has to produce more bile acids, which are needed by the body for fat absorption, it uses cholesterol in the blood stream to do so. This results in a reduction in circulating (LDL) cholesterol levels.

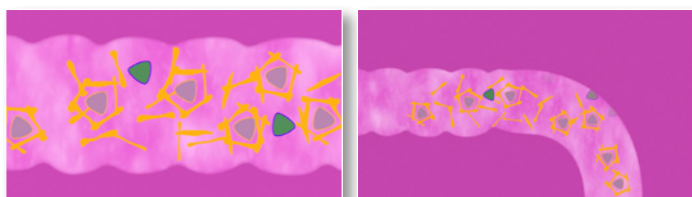


Figure 1: oat beta-glucan forms a viscous gel inside the small intestine, which is responsible for lowering LDL cholesterol

This action means that the extent of the cholesterol lowering effect of oat beta-glucan largely depends on its viscosity. The implication is that a high molecular weight is important in order to release it from the food matrix during digestion and enable it to form an effective viscous gel.

Manufacturers can minimize any potential loss of molecular weight during processing, such as extrusion, by ensuring careful monitoring and control systems are in place.

Did you know?

It is estimated that 90% of cardiovascular disease is preventable. Healthy nutrition is key to prevention by decreasing risk factors.²

to understand, oats also tap into the wider, rapidly growing trend for natural foods made from ‘real’ ingredients.

The positive effects on heart health are thanks to oats being a naturally rich source of beta-glucan. There is robust scientific evidence to demonstrate the role of oat beta-glucan in reducing blood cholesterol and stabilizing blood sugar levels. In fact, it has been established that daily consumption of at least 3g of oat beta-glucan can achieve a reduction in LDL cholesterol of up to 10% and reduce the risk of CVD by as much as 20%.³

Reduces glycemic response

This characteristic is also key to controlling glucose and blood sugar levels. The rise in viscosity caused by oat beta-glucan acts as a preventative barrier; it slows down digestion and the absorption of carbohydrates, so preventing sudden spikes in blood sugar levels that would otherwise encourage the body to produce and store fat.

In order to benefit from the blood sugar lowering property, a product must contain at least 4g of bioactive oat beta-glucan per 30g of carbohydrate consumed during a meal.

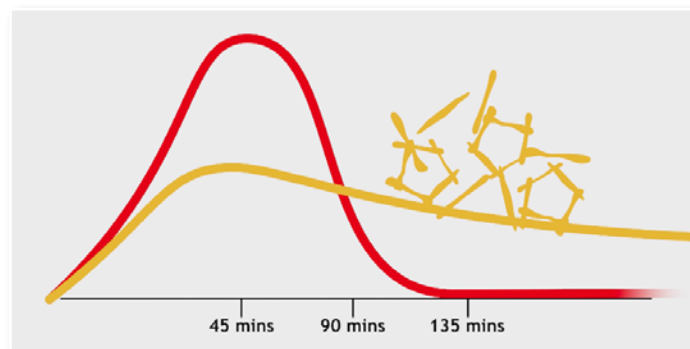


Figure 2: oat beta-glucan prevents a sudden rise in blood sugar levels

“The working mechanism behind the claimed effects of oat beta-glucan has been conclusively proven and depends on the increased viscosity of the consumed food and the beta-glucan contained therein. When consumed food reaches the small intestine, a high viscosity delays the uptake of nutrients including glucose.”

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Solid science

Numerous clinical studies support the positive effect of oat beta-glucan on heart health, and the ingredient continues to attract attention from internationally recognised bodies keen to explore its full potential. The European Society of Cardiology⁴ and the US National Cholesterol Education Program,⁵ for example, have both recommended the consumption of oat beta-glucan as an accepted lifestyle modification to reduce cardiovascular risk.

A recent research paper provides further evidence to support oat beta-glucan's cholesterol lowering potential. The meta-analysis, published in the American Journal of Clinical Nutrition,⁶ was the first to only evaluate trials where high molecular weight oat beta-glucan have been used.

- ✓ The analysis of 28 randomized controlled trials found that 3g of oat beta-glucan was associated with LDL and total cholesterol reductions of 0.25mmol/L and 0.30 mmol/L respectively.
- ✓ Such reductions are between 50 and 100% higher than those published in previous analyses.
- ✓ These benefits were observed globally and across different consumer demographics including lean, overweight and obese men and women, with and without type-2 diabetes.

Expert view:

"We now know more about the importance of the physico-chemical properties of oat beta-glucan in determining its ability to reduce cholesterol and blood glucose in humans."

Hear from the author, Dr. Thomas Wolever,
Department of Nutritional Sciences, University of Toronto

Global approval

Clear communication of the proven benefits of oat beta-glucan is a strong advantage for products positioned to appeal to an increasingly sceptical consumer audience. Health claim approvals confirming its positive effect on cardiovascular health by respected independent bodies around the world provide manufacturers with a credible platform for on-pack labeling:



The European Food Safety Authority (EFSA): verified a link between reduced blood cholesterol levels and the consumption of at least 3g of oat beta-glucan per day.⁷



The European Commission: authorized EFSA's Article 14 health claims for cholesterol lowering and the associated reduced risk of developing heart disease.



EFSA: issued a positive opinion on the 13.1 article claim linking beta-glucan intake to healthy blood glucose.



The US Food and Drug Administration: approved health claims recognizing the cholesterol lowering effect of at least 3g per day oat beta-glucan.⁸



Food Standards Australia New Zealand: stated that as part of a diet low in saturated fat, 3g of beta-glucan each day is required to help lower cholesterol re-absorption.

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Conclusion

Prevention is the key to keeping the heart free of problems. A healthy, active lifestyle is the first step to cardiovascular fitness. When combined with effective weight management and good nutrition, the risk of cardiac event can be significantly reduced.

OatWell®

DSM's OatWell® oat beta-glucan is an oat bran powder high in oat beta-glucan. Produced by milling whole oat kernels, OatWell® contains a natural combination of oat beta-glucan and insoluble fibers as well as large quantities of protein, unsaturated fatty acids plus vitamins and minerals.

The proven efficacy of OatWell® formed the basis of EFSA's Article 14 health claim approval.⁸ 11g of OatWell® contains the recommended daily intake of 3g of oat beta-glucan and only 70 kcal.

Natural and highly versatile, OatWell® powder can be used in a wide range of applications including breads, biscuits, cereals, powder drinks and dietary supplements.

It is well accepted that nutritional ingredients can be used to maintain heart health, but scientific substantiation and consumer understanding are required if a product is to be a success in a competitive market.

Concentrated goodness from oats



Figure 3: one serving of bioactive OatWell® has the same amount of beta-glucan as 3-4 portions of traditional oat products



® For DSM, quality is a way of life. This is the core of **Quality for Life™**. **Quality for Life™** is the mark of **quality, reliability and traceability**. It means that DSM customers are getting the best ingredients, knowing the source on which they depend. **Quality for Life™** means **sustainability**. It symbolizes our commitment to our environment, consumers, our business partners, our people and the regulatory framework that governs our operations. **With the Quality for Life™ seal, we aim to ensure peace of mind for you and for your customers.** www.qualityforlife.com

For more information:

For more information about oat beta-glucan research, regulatory guidance or OatWell® applications, please email: ruedi.duss@dsm.com

Alternatively, visit: www.dsm.com/human-nutrition. You can also [click here](#) watch DSM's video on OatWell® for an explanation of the science behind the health benefits that it provides.

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